

- *Welcome !!!*

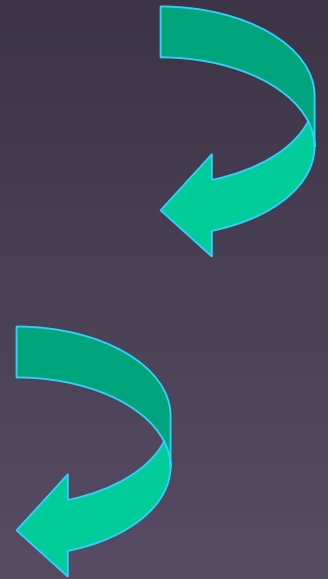


Department of Conservation & Recreation

CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

TMDL Process (3 parts)

- TMDL development
- Implementation Plan development
- Implement the plan



A photograph of a stream with a small waterfall and a tree in the foreground. The stream is surrounded by bare trees and brush, suggesting a winter or late autumn setting. The water is flowing over a small drop, creating a small waterfall. A single tree stands in the foreground, its reflection visible in the water. The background shows a dense thicket of bare trees and brush.

Steps after EPA Approval

- Develop Implementation Plans
- Implement **Best Management Practices**
- Continue stream monitoring

A photograph of a forest stream with sunlight filtering through the trees. The water is clear and reflects the surrounding greenery. The trees are tall and thin, with dense foliage. The overall scene is peaceful and natural.

Implementation Plan Development

Implementation Plan development is required by state legislation

DCR has lead for NPS TMDL implementation plans

DCR, DEQ, VDH and other state, federal and local agencies will coordinate on plan development

Implementation Plan Development

- Implementation Plan will be done locally
- Stakeholders will have the opportunity to participate in the plan development
- DCR's IP Guidance Document

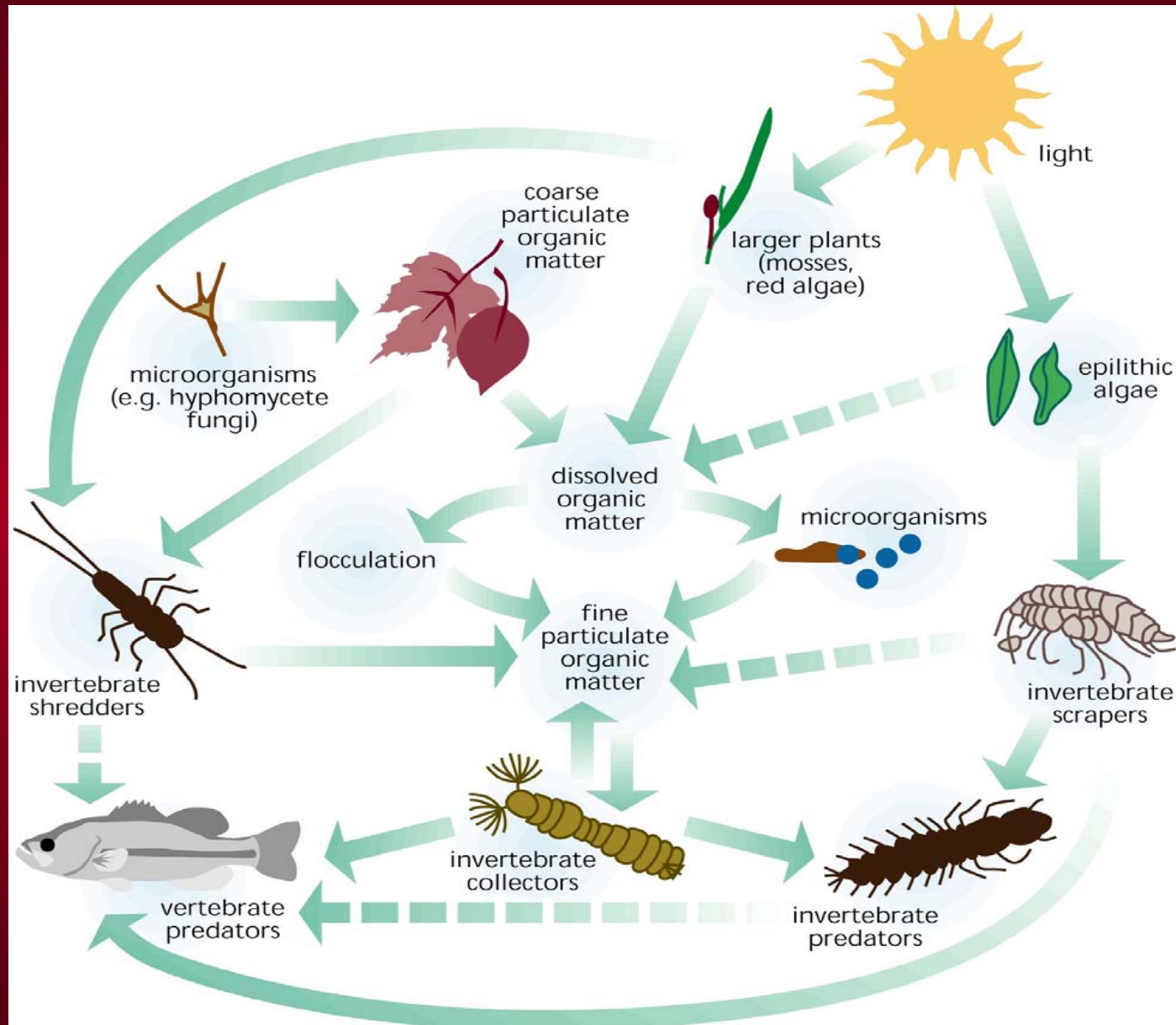
Integration with other Watershed Plans

- Multiple water quality programs and activities
- Each has specific geographical boundaries and goals
- TMDL implementation will be coordinated with other plans
- Chesapeake Bay 2000 Agreement – small watershed plans
- Tributary Strategies
- Local Comprehensive Plans
- Etc.

Potential Funding Source\$

- Potential funding sources for best management practices (BMPs) selected during Implementation Plan development:
 - ♦ **USDA Programs - CREP/EQIP**
 - ♦ **WQIA projects**
 - ♦ **Section 319 Funds**
 - ♦ **State Revolving Loan Funds**
 - ♦ **Cost-Share Program**
 - ♦ **Tax Credits**

Energy Flow



Stream Order

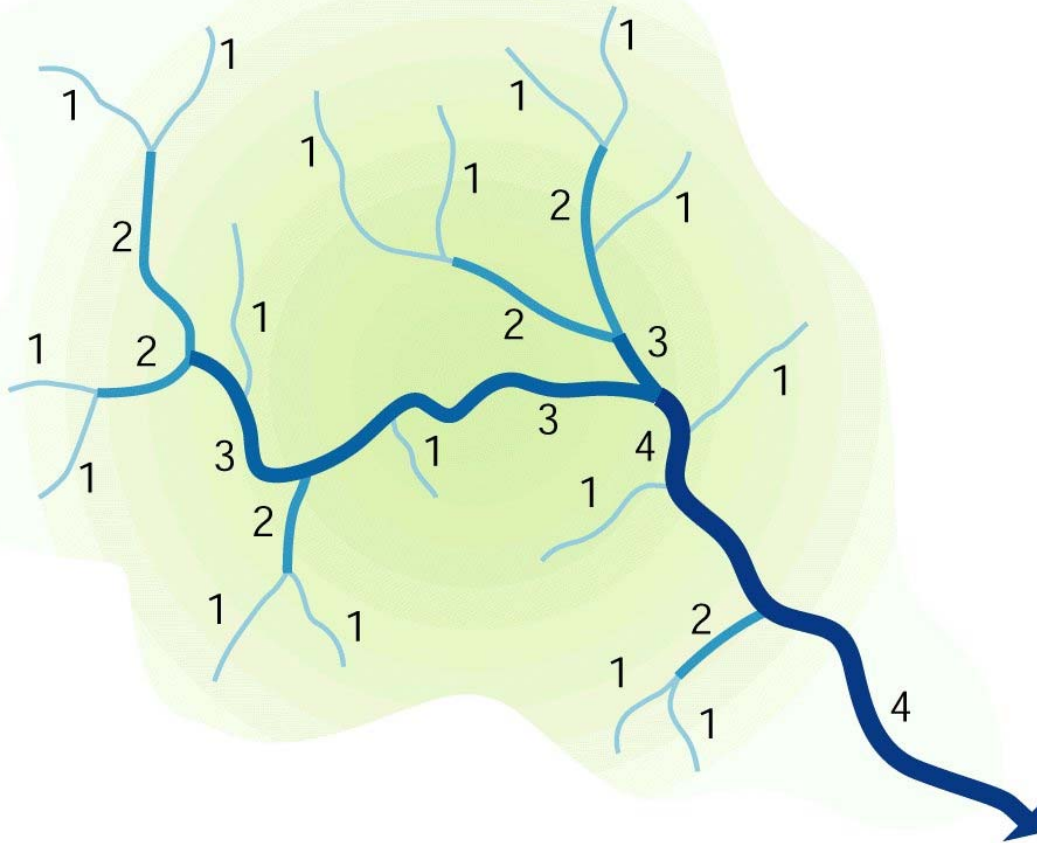
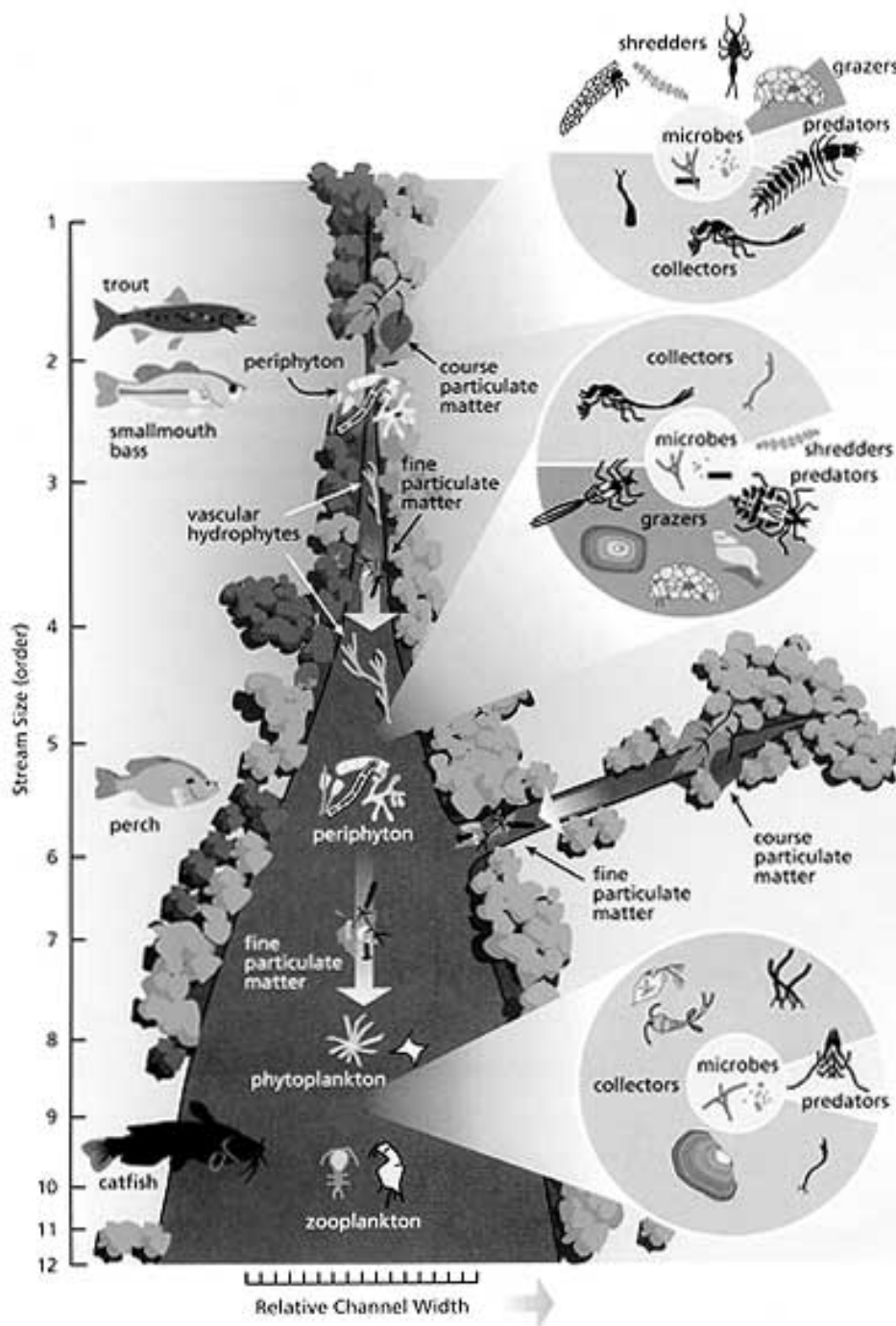


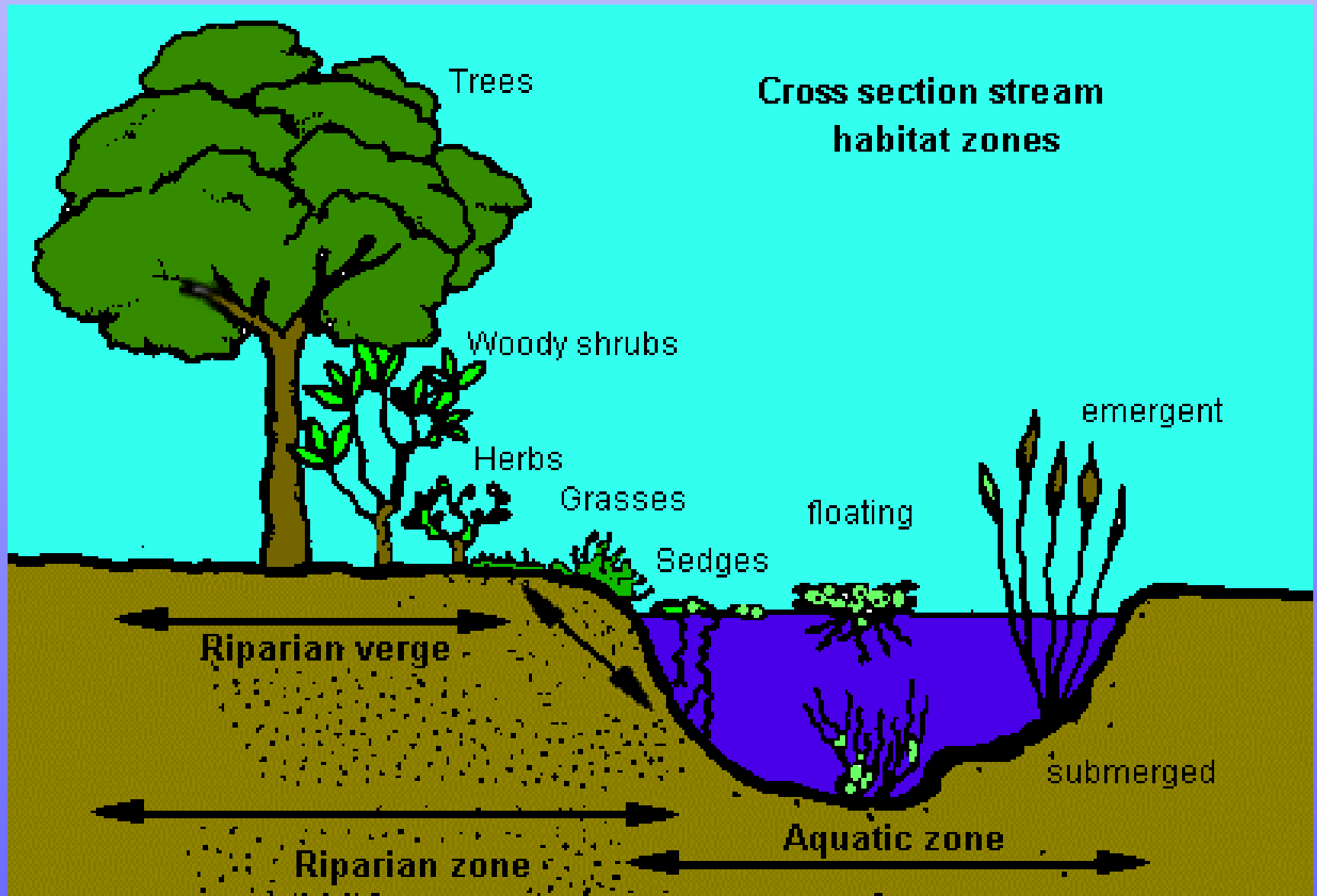
Fig. 1.30 – Stream ordering in a drainage network. "1" = first order stream; "2" = second order stream, etc.
In Stream Corridor Restoration: Principles, Processes, and Practices (10/98).
Interagency Stream Restoration Working Group (15 federal agencies)(FISRWG).

- $2 + 2$ does not always = 4 !

River Continuum Concept



Riparian Zone



Habitat impacts are detected during habitat assessments





Stream Canopy

Well developed

- Headwaters stream

Stream Canopy Intermediate Stage

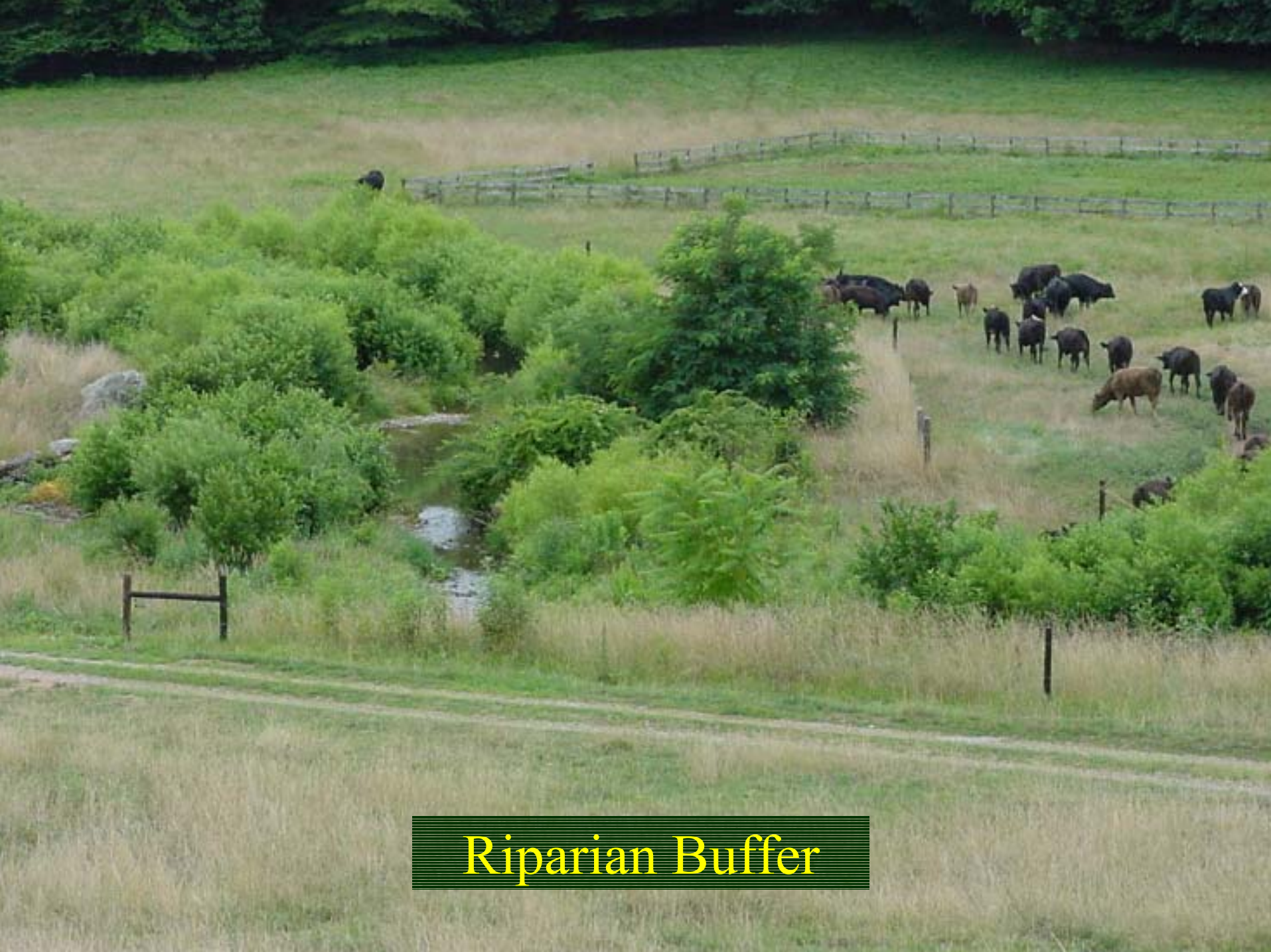


Stream Canopy ???



Riparian Vegetation





Riparian Buffer

Hardened Stream Crossing – CREP Contract on Hutton Creek



Feedlot Regrowth - 4 months



M. F. Holston - Riparian Buffer on Hutton Creek – Maple Springs Dairy

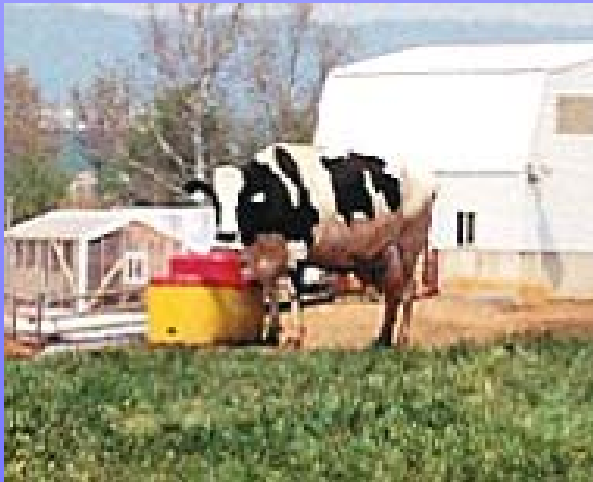


A photograph of a rural landscape. In the foreground, there is a field of tall, dry, yellowish-brown grass. In the middle ground, a rectangular area is enclosed by a simple wire fence supported by wooden posts. Behind this fenced area is a lush green cornfield. In the background, there are several trees, a small building, and distant mountains under a clear sky.

Volunteer Exclusion Fencing



Watering Systems



A photograph of an urban stream flowing under a bridge. The stream is surrounded by dense green vegetation on both sides. In the background, there are several buildings: a wooden building on the left, a white building with large arched windows in the center, and a red brick building on the right. A parking lot with several cars is visible behind the red brick building. The text "Urban BMPs ?!?!?" is overlaid in yellow on the left side of the image.

Urban
BMPs ?!?!?





Channel morphology

Substrate



- Bedrock
- Boulders
- Cobble
- Gravel
- Sand
- Silt
- Clay

Channel Sinuosity



- Measured by # bends per linear unit

Category 1 - Stream Exclusion/Improve Riparian Areas

- FR-3 Woodland buffer filter area
- SL-6 Grazing land protection
- WP-2B Stream crossing & hardened access
- WP-4B Loafing lot mgmt system (dairy only)
- WP-2T Stream Protection
- WP-2A Streambank stabilization (with WP-2T)

BMP Category 3 - Reduce Sediment

- FR-1 Reforestation of erodible crop & pastureland
- SL-1 Permanent vegetative cover on cropland
- SL-8B Small grain cover crop for nutrient management
- SL-11 Permanent vegetative cover on critical areas
- WP-3 Sod waterway
- WQ-1 Grass filter strip

Restoration



- Before

Restoration



- Completion of project

Restoration



- Sometime later...

Cooperation...
It works!!!





MIKE SHELOR
RETIRED !!!



DCR

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